MICROCHIP

PIC32 Microcontroller Families

With USB, CAN and Ethernet

www.microchip.com/PIC32

Performance Leading PIC32™ Microcontroller

Building on the heritage of Microchip Technology's world-leading 8- and 16-bit PIC® microcontrollers, the PIC32 family delivers 32-bit performance and more memory to solve increasingly complex embedded system design challenges.

High Performance & Memory

Power your RTOS, Touch Screens and Complex Applications

- 80 MHz, 1.56 DMIPS/MHz MIPS M4K Core
- 512K Flash with pre-fetch cache
- 128K RAM for data and program execution
- Fast interrupts and context switch

Industry Leading Compatibility

Create Scalable Products in a Consistent Environment

- Common MPLAB® development tools
- Pin & peripheral compatible with 16-bit PIC MCUs
- Common software stacks across MCUs
- Common tools environment ~600 PIC MCUs

Fast, Easy Development

Shorten Your Projects and Reuse Hardware, Software and Tools

- Free USB, TCP/IP, graphics and file system source code
- Broad Third Party ecosystem
- $49.99 starter kit with free C compiler
- Hardware trace for less than $80

More Design Options

Simplify Your System Design Through Integration

- Extensive analog and digital peripherals
- USB Host/Device/OTG, Dual CAN, 10/100 Ethernet
- Up to 16 DMA channels
- 16-bit parallel master port

FREE Microchip Software Libraries

www.microchip.com/pic32libraries

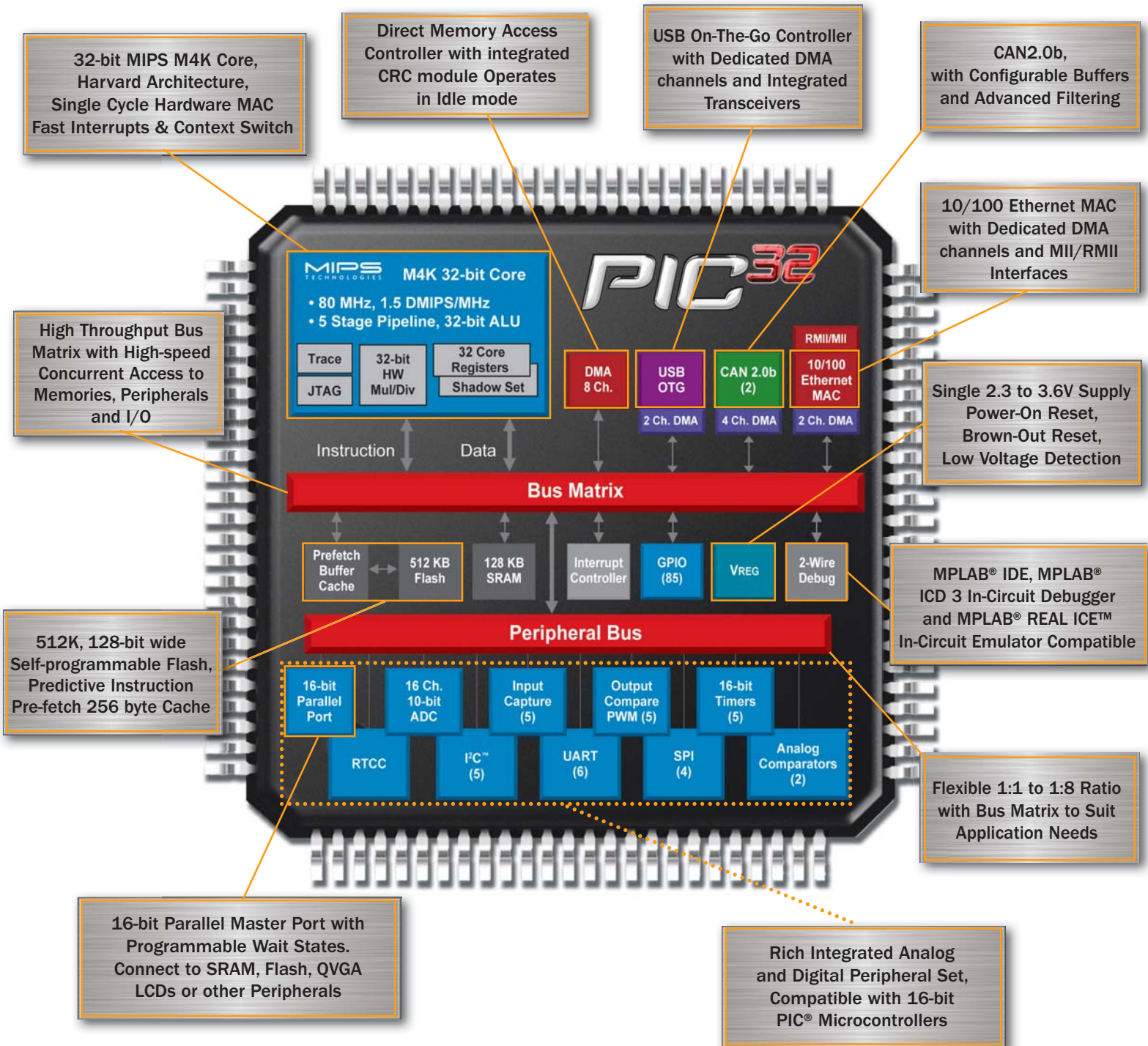| Category	Description
USB	USB Host, Device, On-the-Go with Class Drivers
Graphics	Microchip Graphics Library
CAN	CAN API Library for PIC32 with Integrated CAN Controller (in compiler) Standalone CAN Library - includes support for MCP2515
Connectivity	Microchip TCP/IP with SSL and BSD IrDA® Stack* ZigBee® Pro Protocol Stack** ZigBee® Smart Energy Profile Suite** MiWi™ Protocol Stack for 802.15.4 Networks
Audio and Speech	Audio Library for PIC32MX: Speex, ADPCM and WAV
Encryption	AES 128-, 196- and 256-bit Encryption & Decryption Library Public Key Cryptography Library (RSA)
Basic Libraries	16- and 32-bit File System Libraries FatFs File System Library DSP Library (located in MPLAB C compiler for PIC32) Math Library (located in MPLAB C compiler for PIC32) Peripheral Library (located in MPLAB C compiler for PIC32) EEPROM Emulation IEC 60730 Class B Software**
Boot Loader	Serial Port Boot Loader USB Host Boot Loader**

* Contact Microchip for availability.
** Software planned for future - get the latest updates at www.microchip.com/pic32libraries.

www.microchip.com/PIC32

Inside the PIC32™ Microcontroller

32-bit MIPS M4K Core,
Harvard Architecture,
Single Cycle Hardware MAC
Fast Interrupts & Context Switch

Direct Memory Access
Controller with integrated
CRC module Operates
in Idle mode

USB On-The-Go Controller
with Dedicated DMA
channels and Integrated
Transceivers

CAN2.0b,
with Configurable Buffers
and Advanced Filtering

10/100 Ethernet MAC
with Dedicated DMA
channels and MII/RMII
Interfaces

High Throughput Bus
Matrix with High-speed
Concurrent Access to
Memories, Peripherals
and I/O

Single 2.3 to 3.6V Supply
Power-On Reset,
Brown-Out Reset,
Low Voltage Detection

512K, 128-bit wide
Self-programmable Flash,
Predictive Instruction
Pre-fetch 256 byte Cache

MPLAB® IDE, MPLAB®
ICD 3 In-Circuit Debugger
and MPLAB® REAL ICE™
In-Circuit Emulator Compatible

16-bit Parallel Master Port with
Programmable Wait States.
Connect to SRAM, Flash, QVGA
LCDs or other Peripherals

Flexible 1:1 to 1:8 Ratio
with Bus Matrix to Suit
Application Needs

Rich Integrated Analog
and Digital Peripheral Set,
Compatible with 16-bit
PIC® Microcontrollers

Diagram labels

MIPS TECHNOLOGIES — M4K 32-bit Core
- 80 MHz, 1.5 DMIPS/MHz
- 5 Stage Pipeline, 32-bit ALU

Trace | 32-bit HW Mul/Div | 32 Core Registers
JTAG | | Shadow Set

Instruction   Data

DMA 8 Ch. | USB OTG | CAN 2.0b (2) | RMII/MII 10/100 Ethernet MAC
2 Ch. DMA | | 4 Ch. DMA | 2 Ch. DMA

Bus Matrix

Prefetch Buffer Cache ↔ 512 KB Flash | 128 KB SRAM | Interrupt Controller | GPIO (85) | VREG | 2-Wire Debug

Peripheral Bus

16-bit Parallel Port | 16 Ch. 10-bit ADC | Input Capture (5) | Output Compare PWM (5) | 16-bit Timers (5)
RTCC | I²C™ (5) | UART (6) | SPI (4) | Analog Comparators (2)

Package Options

64-pin

64-lead TQFP
10 x 10 (PT)

64-lead QFN
9 x 9 (MR)

100-pin

100-lead TQFP
12 x 12 (PT)

100-lead TQFP
14 x 14 (PF)

100-ball BGA
10 x 10 (BG)

Developing with the PIC32 Microcontroller

Microchip is the only silicon vendor with a full 8-, 16- and 32-bit microcontroller portfolio supported by a unified development environment. The MPLAB® IDE is free and easy to use.
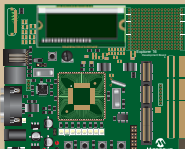
PIC32 Starter Kits

Getting started is easy with any of the fully integrated PIC32 Starter Kits featuring simple installation, getting started tutorial and PIC32 starter board with easy USB connection to your PC. The Starter Kits include:

- MPLAB IDE and MPLAB C32 C Compiler†
- PIC32 Starter Board with Integrated Programmer and Debugger
- Code Examples, Documentation, Tutorials and Sample Projects, Optional I/O Expansion board allows signal breakouts and connections for PICtail™ Plus Daughter Cards

†Lite version has **no code size limit** and full optimizations. After 60 days some optimizations are disabled.

PIC32 Development Tools
Choose a Platform:

Starter Kit Platform

OR

Explorer 16 Platform

PIC32 Starter Kit (DM320001)

USB II Starter Kit (DM320003-2)

PIC32 Ethernet Starter Kit (DM320004)

Explorer 16 Development Board (DM240001)

PIC32 Plug-in Modules (MA320001) (MA320002) (MA320003)

+

— OPTIONAL —

AND

PIC32 I/O Expansion Board (DM320002)

MPLAB® ICD 3 In-Circuit Debugger (DV164035)

MPLAB® REAL ICE™ In-Circuit Emulation System (DV244005)

OR

PICtail™ Boards Common to Both Development Platforms

Graphics PICtail™ Board (AC164127-3)

ECAN/LIN PICtail™ Plus Daughter Board (AC164130)

802.11 ZeroG PICtail™ (AC164136-2)

MRF24J40MA 2.4 GHz RF Card (AC164134)

... and many more!

PIC32 Product Family

Device	Flash KB + Boot Flash	SRAM KB	Pin Count	MHz	SPI	I²C	UARTs	DMA Channels General/Dedicated	USB	10/100 Ethernet	CAN 2.0b	IC/OC/PWM	10-bit ADC 1 Msps	Analog Comparator	Timers 16b/32b	RTCC	Parallel Master Port	JTAG Program, Debug, Boundary Scan
PIC32MX320F032H	32 + 12	8	64	40	2	2	2	0/0	N	N	N	5/5/5	16 ch	2	5/1	1	Y	Y
PIC32MX320F064H	64 + 12	16	64	40														
PIC32MX320F064H			64	80														
PIC32MX320F128H	128 + 12	16	64	80														
PIC32MX320F128L			100															
PIC32MX340F128H		32	64															
PIC32MX340F128L			100															
PIC32MX340F256H	256 + 12	32	64	80				4/0										
PIC32MX360F256L			100															
PIC32MX340F512H	512 + 12	32	64	80														
PIC32MX360F512L			100															
PIC32MX420F032H	32 + 12	8	64	40	1	2	2	0/2	Y	N	N	5/5/5	16 ch	2	5/1	1	Y	Y
PIC32MX440F128H	128 + 12	32	64	80	1													
PIC32MX440F128L			100		2													
PIC32MX440F256H	256 + 12	32	64	80	1			4/2										
PIC32MX460F256L			100		2													
PIC32MX440F512H	512 + 12	32	64	80	1													
PIC32MX460F512L			100		2													
PIC32MX575F256H	256 + 12	64	64	80	3	4	6	8/4	Y	N	1	5/5/5	16 ch	2	5/1	1	Y	Y
PIC32MX575F256L			100		4	5												
PIC32MX575F512H	512 + 12	64	64	80	3	4												
PIC32MX575F512L			100		4	5												
PIC32MX675F256H	256 + 12	64	64	80	3	4	6	8/4	Y	Y	N	5/5/5	16 ch	2	5/1	1	Y	Y
PIC32MX675F256L			100		4	5												
PIC32MX675F512H	512 + 12	64	64	80	3	4												
PIC32MX675F512L			100		4	5												
PIC32MX695F512H		128	64	80	3	4												
PIC32MX695F512L			100		4	5												
PIC32MX775F256H	256 + 12	64	64	80	3	4	6	8/8	Y	Y	2	5/5/5	16 ch	2	5/1	1	Y	Y
PIC32MX775F256L			100		4	5												
PIC32MX775F512H	512 + 12	64	64	80	3	4												
PIC32MX775F512L			100		4	5												
PIC32MX795F512H		128	64	80	3	4												
PIC32MX795F512L			100		4	5												

Third-party Application Software and Hardware Support

ASHLING
THE DEVELOPMENT SYSTEMS COMPANY

expresslogic

Micriµm
Empowering Embedded Systems

RoweBots

AVIX-RT

freeRTOS

MICRO/SYS

SEGGER

CMX SYSTEMS

Green Hills SOFTWARE, INC.

OLIMEX

sparkfun ELECTRONICS

DIGILENT

LAUTERBACH

PUMPKIN REAL-TIME SOFTWARE

TechToys

easyGUI
eflightworks

Macraigor Systems
Complete JTAG Debug Support

RAMTEX

zero G